Remarks

Claims 1, 16 and 32 are the independent claims of the present application.

Claims 1, 16 and 32 have been amended to reflect independence of the impedance to circuit ground of said object. These amendments are clearly supported in the originally filed application (see, e.g., the first paragraph of the "Summary of the Invention" section, at page 3, lines 15-17), thus they do not constitute new matter. Moreover, it is submitted that these amendments do not constitute narrowing amendments, but rather constitute clarifying amendments. In support of this position, the Applicant notes that, since the "object" referred to in the body of the original versions of claims 1, 16, and 32 lacked any express limitations regarding impedance to circuit ground, it is logical to construe these claims as being independent of the impedance to circuit ground of said object. The above-described amendments merely make this explicit.

In the Office Action, the Examiner rejected claims 1-2, 15-16 and 32 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,016,490 to Weckenmann et al. ("Weckenmann") in view of U.S. Patent No. 6,326,227 to Thomas et al. ("Thomas"). The Applicant respectfully traverses these rejections.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success.

Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143 (Rev. Feb. 2003).

It is respectfully submitted that the cited references do not teach or suggest all the claim limitations.

Referring first to claim 1 as amended, it is noted that the claim is directed to a proximity detector comprising a transmitting electrode, a receiving electrode, and at least one ground electrode, arranged and sized such that, "upon the approach of an object, <u>independent of the impedance to circuit ground of said object</u>," [emphasis added] a signal received by the receiving electrode decreases, at least until the object is within a threshold distance. It is submitted that neither of the cited references teaches or suggests a proximity detector in which a signal received by the receiving electrode decreases upon the approach of an object <u>independent of the impedance to circuit ground</u>.

At the bottom of page 2 to page 3, lines 1-2 of the Office Action, the Examiner acknowledges that Weckenmann fails to specify a proximity detector suitable for detecting objects regardless of their impedance to circuit ground. Indeed, it is abundantly clear from Weckenmann that the proximity detector described therein is only for detecting grounded objects (see, e.g., abstract at line 15, column 2 lines 12 and 24, column 4 lines 7-11, claim 1 (at line 23 of column 6), and Fig. 1 (wherein finger 21 is shown to be grounded)).

At page 3, lines 3-10 of the Office Action, the Examiner states that, because Thomas

teaches that fingers are sometimes ungrounded objects, it would have been obvious to one of ordinary skill in the art "that a detector such as taught by Weckenmann et al. would have encountered grounded fingers at some times and ungrounded fingers at other times." With respect, whether or not it is obvious that Weckenmann's detector would sometimes encounter ungrounded fingers is not relevant to the issue at hand, namely, whether or not it is obvious in view of Thomas that Weckenmann's detector could be capable of detecting ungrounded fingers. In point of fact, Weckenmann's detector is wholly ill-suited for detecting ungrounded objects, for the following reasons.

As is made clear by the numerous references in Weckenman (enumerated above) to the finger as a grounded mass, the grounding of a target object is key to its detection by the Weckenmann device. This is due to the fact that a grounded object, together with the metallic shield 20 (see FIG. 1) of the device, which acts as a Faraday cage, will appear to the device as a capacitor with one terminal connected to the shield and the other connected to ground. (The shield 20 is floating to a DC current, but it is clearly capacitively coupled to both the transmitter and the receiver, as stated at column 2 line 8). In contrast, an ungrounded object (i.e. an object with high impedance to circuit ground) will appear to the device as a capacitor with one terminal connected to shield 20 and the other connected to nothing. Accordingly, and contrary to the Examiner's argument at page 3, lines 11 – 19 of the Office Action, Weckenmann's detector may not respond at all to an object having high impedance to circuit ground. Indeed, this is likely the reason that no claim is made in Weckenmann that ungrounded objects can be detected.

Accordingly, it is submitted that neither Weckenmann nor Thomas, nor the two in

combination, teaches the claim limitation of a decreasing signal at a receiving electrode "upon the approach of an object, independent of the impedance to circuit ground of said object," and that as a result, no *prima facie* case of obviousness has been established in respect of claim 1.

In further support of the position that claim 1 cannot be rendered obvious by the cited references, the Applicant wishes to reemphasize a point that was made in the originally filed application. The point is that, due to the disparate behavior of known proximity detectors when detecting grounded objects versus when detecting ungrounded objects, when known proximity detectors are combined, the resulting device will be incapable of reliably detecting objects having certain intermediate impedances to circuit ground. As stated at page 2, lines 23 – 31 of the application, in known proximity detectors, objects with high impedance to earth ground trigger an increase in current at the receiving electrode, whereas objects with low impedance to circuit ground trigger a decrease in current at the receiving electrode. It follows that, for certain objects with intermediate impedance to circuit ground, no perceptible change in current will occur at the receiving electrode of a known detector. Thus, objects having such a degree of ground impedance may, disadvantageously, escape detection by known devices.

In contrast, when an object approaches a proximity detector as claimed in claim 1, the signal received at the receiving electrode decreases (at least until the object is within a threshold distance) independent of whether the object has low, high or intermediate impedance to ground. This capability is not provided merely through combination of known proximity detectors.

For this reason, it is submitted that claim 1 cannot be rendered obvious by the cited

references.

Turning to independent claim 16, similar arguments apply. Although the language of claim 16 as amended does not expressly indicate that, upon the approach of an object, independent of the impedance to circuit ground of said object, the signal received by the receiving electrode will decrease, it is indicated in claim 16 that the effective impedance between the receiver electrode and the at least one circuit ground electrode will decrease more quickly than the sum of the impedance between the receiver electrode and the at least one circuit ground electrode and the impedance between the transmitting electrode and the receiving electrode upon the approach of such an object. Because this characteristic is equivalent to the signal decrease referenced in claim 1, it is submitted that, for the same reasons as were set forth above in respect of claim 1, no *prima facie* case of obviousness has been established with respect to claim 16, and that claim 16 cannot be rendered obvious by the cited references.

Similarly, although independent claim 32 as amended does not expressly indicate that, upon the approach of an object, independent of the impedance to circuit ground of said object, the signal received by the receiving electrode will decrease, claim 32 is directed to a proximity detector in which, upon the approach of an object having any impedance to ground, the capacitance between the object and circuit ground increases more quickly than the product of the capacitance between the object and the transmitting electrode and the capacitance between the object and the receiving electrode. Again, because this characteristic is equivalent to signal decrease referenced in claim 1, it is submitted that, for the same reasons as were set forth above in respect of claim 1, no *prima facie* case of obviousness has been established with respect to

claim 32, and that claim 32 cannot be rendered obvious by the cited references.

With respect to claim 32, it is further noted that the claim is directed to a sensor comprising a transmitting electrode driven with a low impedance and a receiving electrode held at circuit ground potential (emphasis added). It is submitted that these claim limitations, which are absent from the referenced portions of the cited references, constitute a further reason why the Examiner has failed to establish a *prima facie* case of obviousness in respect of that claim.

The remaining claims of the present application depend either directly or indirectly from base claims 1 or 16. As the dependent claims add further limitations to the base claims, the it is respectfully submitted that the dependent claims cannot be rendered obvious if the base claims are not rendered obvious.

In view of the foregoing, favorable reconsideration and allowance of the application are earnestly solicited.

Respectfully submitted,

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